

عنوان مقاله:

A STUDY ON THE ALUMINIZING OF ELECTRODEPOSITED NICKEL AT 500 °C

محل انتشار:

مجله علم مواد و مهندسی ایران، دوره 7، شماره 2 (سال: 1389)

تعداد صفحات اصل مقاله: 8

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خلاصه مقاله:

Abstract: nanocrystalline nickel samples with the grain size of ~ 25 nm were prepared via direct current electrodeposition and aluminized for different durations by pack cementation method at 500 °C. The samples were examined by SEM, EDS and XRD techniques. According to results, short time aluminizing resulted in the formation of a single aluminide layer whereas at long duration two distinct aluminide layers were formed. The growth kinetics of the coating was non-parabolic at short times while it obeyed the parabolic law at long duration. The parabolic growth rate constant of single phase coating formed on electrodeposited samples was about $3.0 \text{ } \mu\text{m}^2 / \text{h}$ approximately 3 times greater than the data reported for coarse grained nickel ($0.8 \text{ } \mu\text{m}^2 / \text{h}$). Meanwhile, the overall growth rate constant was decreased to $11.7 \text{ } \mu\text{m}^2 / \text{h}$, when double aluminide layers formed on nanocrystalline nickel. In this research, aluminizing behavior of ultra fine-grained nickel was investigated. For this purpose, the aluminide layers were examined by

کلمات کلیدی:

Aluminide; Coatings; Kinetics; Nanocrystalline; Nickel

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<https://civilica.com/doc/1723322>

